**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) An optical interleaver, comprising:

a splitting element for splitting an incident beam into a first optical signal directed along a first path and a second optical signal directed along a second path;

a first resonant element positioned along said first path for receiving and filtering said first optical signal and producing a first filtered signal therefrom;

a second resonant element distinct from said first resonant element positioned along said second path for receiving and filtering said second optical signal and producing a second filtered signal therefrom; and

a combining element for combining said first filtered signal and said second filtered signal so that they interfere to produce an output signal.

2. (Original) The optical interleaver of claim 1, wherein said first and second resonant elements each comprise an inner surface and an outer surface, said inner surface being positioned closer to said splitting element than said outer surface, said inner surface being partially reflective, and said outer surface being at least partially reflective.

3. (Original) The optical interleaver of claim 2, wherein said first and second resonant elements each comprise an asymmetric Fabry-Perot resonator.

4. (Original) The optical interleaver of claim 3, wherein said first and second resonant elements each comprise a Michelson-Gires-Tournois resonator.

5. (Original) The optical interleaver of claim 2, said splitting element comprising a partially reflective surface for splitting the incident beam, wherein said splitting element is positioned such that a normal to said partially reflective surface thereof forms an angle

of less than 30 degrees with respect to a path of the incident beam, whereby said optical interleaver has reduced sensitivity to a polarization state of the incident beam.

6. (Original) The optical interleaver of claim 5, wherein said angle between said normal and said path of the incident beam is less than 10 degrees.

7. (Original) The optical interleaver of claim 2, said first resonant element being placed a first distance from said splitting element, said second resonant element being placed a second distance from said splitting element different than said first distance, wherein said first and second paths each comprise an identical collective thickness of optical material.

8. (Original) The optical interleaver of claim 7, said first and second paths each including a preliminary thickness of optical material associated with said splitting element and said first and second resonant elements, said optical interleaver further comprising a compensating optical element placed along said first or second path to equalize the collective thickness of optical material in said first and second paths.

9. (Original) The optical interleaver of claim 7, wherein said first path has an optical path length equal to two times the sum of (i) an optical path length between said splitting element and said first resonator, and (ii) an optical path length of said first resonator, and wherein said second path has an optical path length equal to two times the sum of (i) an optical path length between said splitting element and said second resonator, and (ii) an optical path length of said second resonator.

10. (Original) The optical interleaver of claim 9, said incident beam comprising a wavelength-division multiplexed (WDM) optical signal with a plurality of channels separated by an input channel spacing $\Delta f$, wherein the difference between (a) said optical path length between said splitting element and said second resonator, and (b) said optical path length between said splitting element and said first resonator is approximately equal $c/(4\Delta f)$, whereby said output signal has a free spectral range of $2\Delta f$.

11. (Original) The optical interleaver of claim 10, wherein said optical path length of said first resonator and said optical path length of said second resonator are each approximately two times said difference between (a) said optical path length between said splitting element and said second resonator, and (b) said optical path length between said splitting element and said first resonator.

12. (Original) The optical interleaver of claim 2, wherein said inner surface of said first resonant element has a reflectivity of less than 30%, wherein said inner surface of said second resonant element has a reflectivity of less than 60%, and wherein said outer surfaces of said first and second resonant elements each have a reflectivity above 80%.

13. (Original) The optical interleaver of claim 2, wherein said inner surface of said first resonant element has a reflectivity near 3%, wherein said inner surface of said second resonant element has a reflectivity near 42%, and wherein said outer surfaces of said first and second resonant elements each have a reflectivity near 100%.

14. (Original) The optical interleaver of claim 1, wherein said splitting element also serves as said combining element.

15. (Original) The optical interleaver of claim 1, wherein said splitting element and said combining element are couplers, wherein said first and second paths comprise optical fibers or waveguides, and wherein said first and second resonant elements comprise fiber ring resonators or waveguide ring resonators.

16. (Original) The optical interleaver of claim 15, wherein said first path has an optical path length corresponding to a first amount of optical fiber or waveguide positioned between said splitting element and said combining element and its associated index of refraction, and wherein said second path has an optical path length corresponding to a

second amount of optical fiber or waveguide positioned between said splitting element and said combining element and its associated index of refraction.

17. (Original) The optical interleaver of claim 16, said incident beam comprising a wavelength-division multiplexed (WDM) optical signal with a plurality of channels separated by an input channel spacing Δf, wherein the difference between the optical path lengths of said first and second paths is approximately equal to c/(2Δf), whereby said output signal has a free spectral range of 2Δf.

18. (Original) The optical interleaver of claim 17, wherein each of said first and second fiber ring resonators has an optical path that is twice the difference between the optical path lengths of said first and second paths.

19. (Original) The optical interleaver of claim 18, wherein a coupling ratio of said first fiber ring resonator is greater than 70%, and wherein a coupling ratio of said second fiber ring resonator is greater than 40%.

20. (Original) The optical interleaver of claim 19, wherein the coupling ratio of said first fiber ring resonator is greater than 95%, and wherein a coupling ratio of said second fiber ring resonator is greater than 55%.

21. (Original) An optical interleaver for receiving an incident beam comprising a wavelength-division multiplexed (WDM) optical signal with a plurality of channels separated by an input channel spacing Δf and for generating an output signal therefrom, comprising:

a splitting element for splitting the incident beam into a first optical signal directed along a first path and a second optical signal directed along a second path;

a resonant element positioned along said first path for receiving and filtering said first optical signal and producing a filtered signal therefrom, said resonant element comprising a partially reflective inner surface and an at least partially reflective outer

surface, said inner surface being positioned closer to said splitting element than said outer surface;

a mirror element positioned along said second path for receiving and reflecting said second optical signal and producing a reflected signal therefrom; and

a combining element for combining said filtered signal and said reflected signal to produce the output signal;

wherein said optical interleaver is configured and dimensioned such that a difference between (a) an optical path length traversed by said first optical signal between said splitting element and said resonant element, and (b) an optical path length traversed by said second optical signal between said splitting element and said mirror element is approximately equal to $c/(4\Delta f)$, and wherein said optical interleaver is configured and dimensioned such that an optical path length between said inner surface and said outer surface of said resonant element is greater than or equal to $c/(2\Delta f)$.

22. (Original) The optical interleaver of claim 21, said splitting element comprising a partially reflective surface for splitting the incident beam, wherein said splitting element is positioned such that a normal to said partially reflective surface forms an angle of less than 30 degrees with respect to a path of the incident beam, whereby said optical interleaver has reduced sensitivity to a polarization state of the incident beam.

23. (Original) The optical interleaver of claim 22, wherein said angle between said normal and said path of the incident beam is less than 10 degrees.

24. (Original) The optical interleaver of claim 23, said first and second paths each including a preliminary thickness of optical material associated with said splitting element, said resonant element, and said mirror element, said optical interleaver further comprising a compensating optical element placed along said first or second path to equalize the collective thickness of optical material in said first and second paths, whereby said optical interleaver is robust against thermal variations.

25. (Original) An optical interleaver, comprising:

a splitting element for splitting an incident beam into a first optical signal directed along a first path and a second optical signal directed along a second path, said splitting element comprising a partially reflective surface for splitting the incident beam;

a resonant element positioned along said first path for receiving and filtering said first optical signal and producing a filtered signal therefrom;

a mirror element positioned along said second path for receiving and reflecting said second optical signal and producing a reflected signal therefrom; and

a combining element for combining said filtered signal and said reflected signal to produce the output signal;

wherein said splitting element is positioned such that a normal to said partially reflective surface forms an angle of less than 30 degrees with respect to a path of the incident beam, whereby said optical interleaver has reduced sensitivity to a polarization state of the incident beam.

26. (Original) The optical interleaver of claim 25, wherein said angle between said normal and said path of the incident beam is less than 10 degrees.

27. (Original) The optical interleaver of claim 26, said first and second paths each including a preliminary thickness of optical material associated with said splitting element, said resonant element, and said mirror element, said optical interleaver further comprising a compensating optical element placed along said first or second path to equalize the collective thickness of optical material in said first and second paths, whereby said optical interleaver is robust against thermal variations.

28. (Original) The optical interleaver of claim 27, wherein said splitting element also serves as said combining element.

29. (Original) The optical interleaver of claim 28, said incident beam comprising a wavelength-division multiplexed (WDM) optical signal with a plurality of channels

separated by an input channel spacing Δf, wherein said optical interleaver is configured and dimensioned such that a difference between (a) an optical path length traversed by said first optical signal between said splitting element and said resonant element, and (b) an optical path length traversed by said second optical signal between said splitting element and said mirror element is approximately equal to c/(4Δf), whereby said output signal has a free spectral range of 2Δf.

30. (Original) The optical interleaver of claim 29, said resonant element comprising a partially reflective inner surface and an at least partially reflective outer surface, said inner surface being positioned closer to said splitting element than said outer surface, wherein said optical interleaver is configured and dimensioned such that an optical path length between said inner surface and said outer surface of said resonant element is greater than or equal to c/(2Δf).

31. (Currently Amended) A method for filtering an input beam comprising a wavelength-division multiplexed (WDM) optical signal, comprising the steps of:

splitting the input beam into a first beam and a second beam;

directing the first beam along a first path that includes a first resonant cavity;

directing the second beam along a second path that includes a second resonant cavity <u>distinct from said first resonant cavity</u>; and

interferometrically combining said first and second beams to produce an output beam.

32. (Original) The method of claim 31, said step of splitting the input beam comprising the step of directing the input beam to a partially reflective surface oriented such that said first beam and said input beam form an angle that is less than 60 degrees.

33. (Original) The method of claim 32, said WDM signal comprising "n" channels having center wavelengths at $\lambda_1$, $\lambda_2$, $\lambda_3$, $\lambda_4$, etc., and a channel spacing of Δf in Hz, wherein an optical path length traversed by said first beam along said first path differs

from an optical path length traversed by said second beam along said second path such that, upon said step of interferometrically combining, said output beam comprises a plurality of channels having center wavelengths at $\lambda_1$, $\lambda_3$, $\lambda_5$, etc., and a free spectral range of $2\Delta f$ in Hz.

34. (Original) The method of claim 33, said step of interferometrically combining comprising the step of directing the input beam to said partially reflective surface, wherein an optical path length traversed by said first beam between said partially reflecting surface and said first resonant element differs from an optical path length traversed by said second beam between said partially reflecting surface and said second resonant element by an amount approximately equal to $c/(4\Delta f)$.

35. (Original) The method of claim 33, wherein said first path and said second path comprise an identical amount of optical material, whereby said output beam is stable against thermal variations that affect the index of refraction of the optical material.

36. (Original) The method of claim 33, wherein said first and second resonant cavities each comprise an asymmetric Fabry-Perot resonator having an inner mirror of reflectivity R1, and an outer mirror of reflectivity R2, said inner mirror being positioned closer to said partially reflective surface than said outer mirror.

37. (Original) The method of claim 36, wherein said first and second resonant cavities comprise substantially identical optical path lengths between their respective inner and outer mirrors.

38. (Original) The method of claim 37, wherein said substantially identical optical path length is approximately equal to $c/(2\Delta f)$.

39. (Original) The method of claim 36, wherein said inner mirror of said first resonant cavity has a reflectivity of less than 30%, and wherein said inner mirror of said second resonant cavity has a reflectivity of less than 60%.

40. (Original) The method of claim 39, wherein said outer mirrors of said first and second resonant cavities each have a reflectivity of greater than 80%

41. (Original) The method of claim 36, wherein said inner mirror of said first resonant cavity has a reflectivity of less than 5%, and wherein said inner mirror of said second resonant cavity has a reflectivity of less than 45%.

42. (Original) The method of claim 41, wherein said outer mirrors of said first and second resonant cavities each have a reflectivity of approximately 100%.

43. (Original) A method comprising:

causing an initial optical beam to impinge on a beam splitting device at an angle substantially less than 45° and thereby divide into at least a first and second optical input signals;

processing each of said first and second optical input signals, said processing comprising phase modifications such that, when interferometrically recombined, shoulders of an input sequence of frequency bands for transmission of information in at least one of said first and second optical input signals are substantially preserved, to thereby produce respective first and second processed optical signals;

combining the first and second processed optical signals with each other to produce first and second optical output signals;

wherein information in a first output sequence of frequency bands is suppressed in at least one of said output signals; and

wherein the first and second sequences of frequency bands match respective different subsets of said input sequence of frequency bands.

44. (Original) A method as in claim 43 in which said angle does not exceed 30°.

45. (Original) A method as in claim 43 in which said angle does not exceed 20°.

46. (Original) A method as in claim 43 in which said angle does not exceed 15°.

47. (Original) A method as in claim 43 in which said angle does not exceed 10°.